REPORT

# REMOVAL ACTION COMPLETION REPORT

## Ward Transformer Superfund Site, Phase 1
## Raleigh, North Carolina
## (CERCLA Docket No. CERCLA-04-2005-3778)

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**June 2012**

**053-3184**

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## 1.0 INTRODUCTION

This Removal Action Construction Completion Report (Completion Report) has been prepared by Golder Associates Inc. (Golder), the Supervising Contractor for the Ward Transformer Superfund Site, on behalf of the Respondents. This report is in accordance with the requirements of the Removal Action Plan (RAP, Golder 2006a) with supporting documents referenced in Section 7.0 that have been prepared as of August 17, 2011 for the Ward Transformer Superfund Site (Site). The Removal Action was conducted in accordance with the Administrative Settlement Agreement and Order on Consent for Removal Action (Settlement Agreement), Comprehensive Environmental Response, Contribution, and Liability Act (CERCLA) Docket No. CERCLA-04-2005-3778, between the United States Environmental Protection Agency (EPA) and Ward Transformer Company, Inc., Ward Transformer Sales and Services, Inc., Reward Properties, L.L.C., Reward Statesville, L.L.C., Bassett Furniture Industries, Inc., Consolidation Coal Company individually and as the successor by merger to Bishop Coal Company and Itmann Coal Company, and Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc. (collectively the "Respondents").

The Phase 1 Removal Action (RA) excavation, treatment or disposal, and restoration was conducted from July 2007 to May 2011 and successfully met the requirements of the Settlement Agreement at the affected Ward-entity properties and at properties west of the Ward-entity properties, along Reach A of the Unnamed Tributary to Little Brier Creek (Reach A), along that part of Reach A within the Interstate I-540 right-of-way (ROW), portions of Mt. Herman Road in front of the Ward properties, a portion of the Catalyst Manufacturing facility east of Mt. Herman Road, and the northeast portion of the Estes Express Lines (Estes) facility (property owned by B&B Apartments, LLC, B&B) immediately south of the Ward Transformer property. These areas were designated as Phase 1 of the RA.

The Phase 1 RA Site construction work consisted of excavation of polychlorinated biphenyls (PCB)-impacted soil, structure/building demolition, Low Temperature Thermal Desorption (LTTD) treatment of soil to destroy the PCBs, off-Site disposal of soils and debris, backfilling, and Site restoration. The RA demolition included paving, the main Ward Transformer building, the oil tank farm, the Ward water treatment plant, and the former Horizon Forest Products building.

In addition to Phase 1, EPA identified a larger portion of the Estes facility and the surface water drainage course on Raleigh Durham Airport Authority (RDU) property south of Estes as requiring a removal action. These locations are termed Phase 2. As of the date of this report, access to the Estes facility has not been granted to perform the Phase 2 RA work and the scope of work for Phase 2 cannot be finalized until the access terms are determined. Because surface water drainage is from Estes to RDU there is a potential for PCBs to be transported from Estes onto RDU property so a removal action on the RDU property cannot begin before Estes is addressed. Therefore, this report only addresses the work

completed for Phase 1 of the RA, except for Phase 2 delineation data that have been collected as of the date of this report.

## 2.0 SITE INFORMATION

The Site is located near the Raleigh Durham International Airport in a predominantly industrial area of Raleigh, Wake County, North Carolina. Figure 1 shows the location of the Ward Transformer facility, which was constructed in 1964, and the surrounding properties included in the RA.

The Ward Transformer facility had a surface water management system termed the "storm water management / spill control system" in EPA's Enforcement Action Memorandum (EPA, September 2004). This system covered the approximate area shown on Figure 2 and consisted of areas where curbing had been installed generally along the north and west sides of the Ward properties, a surface water storage lagoon, and a water treatment plant (WTP) that was installed sometime after the lagoon and curbing. Surface water collected by the system was diverted into the lagoon. The water was then treated and discharged to Reach A (see Figure 2) under a National Pollutant Discharge Elimination System (NPDES) permit. This system was in place during the RA until it had to be replaced because the treatment plant and lagoon were removed as part of the soil removal excavation. The portion of the Ward facility and the Site within the area of this system is termed the 'inside' area while the portions not within this area are termed the 'outside' areas. The Phase 1 RA area covered approximately 28.8 acres with the plan areas of the excavations and demolished structures covering approximately 25.3 acres.

### 2.1 Background

EPA's Enforcement Action Memorandum incorporated in the Settlement Agreement described four main areas requiring immediate attention:

1. *Unacceptable risk to current employees due to high levels of contaminants at the facility*
2. *Uncontrolled surface water run-off from highly contaminated areas discharging into the Unnamed Tributary to Little Brier Creek*
3. *Uncontrolled surface water run-off from highly contaminated areas discharging in front of the main building*
4. *Storm Water Lagoon – Sediments in the lagoon contain levels of PCBs as high as 2,900 ppm. The integrity of the lagoon and its remaining useful life are in question. As a result, the lagoon may pose a threat of a release.*

To address the four main areas of attention, the Enforcement Action Memorandum divided the proposed actions into two parts:

a) *Recontamination Prevention Actions*
   - i) *Construction of a stormwater management/spill control system that effectively addresses all surface water run off or spills from all areas of the facility in accordance with all applicable Federal, State or local laws, regulations, ordinances, or permits and prevents the release of any hazardous substances outside of the facility;*
   - ii) *Inspection of the existing storm water lagoon by an expert to certify its construction, actual condition, and remaining useful life;*
   - iii) *Implement any recommendations made by the expert to improve* [the] *storm water lagoon.*

b) *Contamination Removal*
   - i) *Further delineate and remove soil with concentrations exceeding 1 ppm PCB, from all areas not effectively controlled by the storm water management/spill control system;*

ii) *Further delineate and remove soil with concentrations exceeding 25 ppm PCB, from all areas effectively controlled by the storm water management/spill control system;*

iii) *Arrange for the ultimate disposal and/or treatment of all excavated soil and debris in a manner satisfactory to EPA;*

iv) *To the maximum extent practicable, return areas which are disturbed by the removal action to their pre-removal state.*

EPA's four main areas were addressed during the RA in accordance with the RAP and Settlement Agreement as follows:

- Risk to Current Employees
  - Ward ceased operations, the facility has been demolished, and the demolition material disposed of off-Site. No study was done to determine the effectiveness of Ward's surface water management system since it was demolished.
- Uncontrolled PCB-impacted sediment in runoff in front of the Ward Main Building
  - Uncontrolled runoff of PCB-impacted sediment has been eliminated. The PCB-impacted soil and concrete has been removed and replaced with clean off-Site backfill. This includes part of Mt. Herman Road and the road drainage ditch.
- Uncontrolled PCB-impacted sediment in runoff to Reach A
  - Uncontrolled runoff of PCB-impacted sediment has been eliminated. PCB-containing soil at the Ward site has been removed and/or treated and treated soil remaining on-Site has been covered to establish vegetation to reduce the potential for erosion.
- Storm Water Lagoon
  - Impacted soil within the lagoon and its embankment has been removed and/or treated. There is no longer a need for Ward's surface water management system.

In summary, the Settlement Agreement authorized two approaches for removal of PCB-containing soil at the Site with different cleanup criteria:

- Remove soil with PCB concentrations exceeding 1 ppm from areas outside Ward's surface water management system and remove soil with PCB concentrations exceeding 25 ppm from areas within Ward's surface water management system, including the lagoon. If this approach had been selected, an evaluation of the surface water management system was required, along with recommendations, as appropriate, for upgrading and maintaining the system, including the water treatment plant and the integrity and security of the lagoon for long-term operation, and assurances were required for the long-term operation and maintenance of that system, together with procedures to ensure the areas were not re-contaminated in the future.

- Remove soil with PCB concentrations exceeding 1 ppm from all areas of the Site and eliminate long-term operation of the surface water management system including the lagoon.

Because Ward Transformer ceased its operations in 2006 and indicated it did not have the resources for long term operation and maintenance of the surface water management system, the Respondents adopted the approach of the 1 mg/kg cleanup criterion. On August 21, 2008, the Respondents proposed a revised cleanup level of 10 mg/kg that would be applicable to soil and thermally treated soil backfill within the approximate footprint of Ward's original surface water management system and covered with one foot of clean material. This change was implemented to be able to continue with the LTTD treatment

process and was approved by EPA on August 26, 2008 (see Section 3.4.3). The < 10 ppm cleanup criterion meets the lower end of EPA's risk-based Aroclor 1260 (the preponderant Aroclor found at the Site) soil remediation goal for groundwater protection for the Site per the RI (Weston 2004, Appendix J). Also, with the < 10 ppm criterion, the treated soil could remain on-Site with a vegetated soil/paving material cover.

The Settlement Agreement also required actions necessary for characterization for disposal of 38 transformer casings that were specifically identified during the Toxic Substances Control Act (TSCA) inspection conducted by EPA on January 10, 2005. As approved by EPA, 25 of these transformer casings were re-sampled and the results were presented in the RAP. The 38 transformer casings were removed for disposal by Waste Management, Inc., prior to the RA Site construction as part of Ward Transformer's business activities. The disposal manifests are provided in Appendix A.

## 2.2 Public Meetings

The following meetings were held to inform the community of the planned removal activities at the Site:

- On June 21, 2006, a public information meeting was held with representatives from EPA, the Respondents and Golder to discuss the RAP and the use of LTTD treatment.
- On April 17, 2007, a public availability session was held to provide information and answer questions about the RAP with representatives from EPA, North Carolina Department of Environment and Natural Resources (NCDENR), the Respondents, Golder, and the RA Contractor.

# 3.0 REMOVAL ACTION

## 3.1 General

In summary, the RA construction included the following elements to satisfy the requirements of the Settlement Agreement:

- Additional delineation sampling and PCB analysis at the Site for PCB impacts
- Excavation of soil and miscellaneous debris with PCBs above the cleanup criteria
- Determination of whether the cleanup criteria had been met after excavation by taking samples from the bottoms and sides of the excavations and analyzing the samples for PCBs, enlarging excavations where the criteria had not been met, and repeating the process until the criteria had been met or the equipment met excavation refusal on rock and/or weathered rock
- Treatment of excavated soil and miscellaneous debris (debris less than approximately 2 inches in size) with greater than 50 mg/kg PCBs in a LTTD unit
- Sampling and demolition of the main Ward Transformer building, the Horizon Forest Building, the tank farm, and Ward's water treatment plant
- Off-Site disposal of building demolition debris and of soil and miscellaneous debris that was not treated in the LTTD unit with PCB concentrations above the 1 mg/kg cleanup criterion at approved facilities
- Collection, treatment and discharge of water that had contacted or potentially contacted PCB-contaminated materials (contact water)
- Backfilling excavations with off-Site borrow and/or treated soil from the LTTD unit
- Restoration of disturbed areas on properties not owned by Ward Transformer to their in-kind condition to the extent practicable. Restoration of Reach A and the adjacent area to meet North Carolina riparian buffer protection rules for the Neuse River basin to the extent practicable as agreed by NCDENR and as agreed with the North Carolina Department of Transportation (NCDOT) and Raleigh Durham Airport Authority. Restoration of the Ward properties to meet Erosion and Sediment Control Plan requirements as agreed by NCDENR, including a one foot vegetated soil/paving cover over the treated soil backfill.

The RA construction activities were conducted in accordance with the RAP and supporting RA documents submitted to and approved by EPA, as listed in Section 7.0, REFERENCES. Specific references are made to the following RA documents in subsequent Sections of this Completion Report:

- Removal Action Quality Assurance Project Plan (QAPP)
- Removal Action Construction Quality Assurance Project Plan (CQAP)
- Stormwater Pollution Prevention Plan (SPPP)
- Removal Action Excavation Plan (Excavation Plan)
- Removal Action Low-Temperature Thermal Desorption Plan (LTTD Plan)

The RA Contractor was Compass Environmental, Inc. (Compass) of Chicago, Illinois. In December 2007, Comapss merged with WRS Infrastructure and Environment (WRS) to form WRScompass. Compass was the prime contractor and operated the LTTD unit to treat PCB-impacted soil. Contaminant Control Inc. (CCI), of Hope Mills, North Carolina, was the major subcontractor for Compass performing excavation, backfilling, some demolition, and Site restoration. The landfill disposal facilities used for the RA were:

- Subtitle D Disposal Facility – Sampson County Disposal, owned by Waste Industries, Inc., Roseboro, North Carolina for soil and debris with < 50 mg/kg PCBs and for painted steel classified as PCB bulk product waste per 40 CFR 761.3 and disposed per 40 CFR 761.62 (b)(1)
- Subtitle C Chemical Waste Disposal Facility for material with ≥ 50 mg/kg PCBs – Heritage Environmental Services LLC, Roachdale, Indiana
- Subtitle C Disposal Facility for paint chips with lead and PCBs – Veolia ES Technical Solutions, Port Arthur, Texas

A summary of the treatment and disposal quantities is as follows:

**Table1: Treatment and Disposal Quantity Summary**

| Description | Quantity (tons) |
|---|---|
| Soil and Miscellaneous Debris Classified ≥ 50 ppm PCBs and Moisture Reduction Lime Treated in the LTTD Unit (Total Tons Treated and Passing) | 304,712 |
| Soil and Debris Material Classified ≥ 50 ppm PCBs to Heritage Environmental Services LLC | 28,530 |
| Soil and Debris Material Classified < 50 ppm PCBs to Sampson County Disposal | 89,239 |
| Material Classified ≥ 50 ppm PCBs to Veolia ES Technical Solutions | Four 55 gallon drums |
| Total Treated and Disposed | 422,481 |

On-Site PCB field screening analyses by immunoassay (SW-846 Method 4020) were employed to keep pace with the excavation and thermal desorption schedules because there was limited space at the site for stockpiling both excavated and treated soil. The on-Site PCB field screening analyses were performed by Genesis Project, Inc., of Smyrna, Georgia, under subcontract to Golder. The off-Site laboratories used by Golder during the RA were:

- Analytical Laboratory – CompuChem Laboratories, Cary, North Carolina
- Analytical Laboratory – SGS Environmental Inc, Wilmington, North Carolina
- Geotechnical Laboratory – Golder Associates, Inc., Atlanta, Georgia

As the Supervising Contractor, Golder monitored the RA activities and performed sampling and analyses to characterize material for excavation, disposal and treatment and to verify that the PCB cleanup criteria

were met. Golder monitored the activities from July 2007 through December 2010. URS of North Carolina (a subcontractor to CCI) monitored the Reach A reconstruction activities from November 2010 through April 2011. The daily construction reports are provided in Appendix B.

The estimated Phase 1 RA construction and monitoring cost as of August 31, 2011, exclusive of EPA past and future costs, is $62.3 million as follows:

**Table 2: Phase 1 RA Construction and Monitoring Cost**

| Description | Cost ($M) |
|---|---|
| Compass as of August 31, 2011 | $54.3 |
| Golder as of August 31, 2011 | $8.0 |
| Total Compass and Golder Costs | $62.3 |
| Golder as a Percentage of Compass' Cost | 15% |
| Golder Subcontracted Analytical Field and Lab Costs | $2.0 |
| Golder Costs without Analytical Costs | $5.9 |
| Golder without Analytical Costs as a Percentage of Compass' Cost | 11% |

Golder's costs shown above include those associated with pre-construction planning and document preparation, construction monitoring, on-Site PCB analyses services, and off-Site laboratory analytical services that were subcontracted through Golder.

Table 3 provides a chronology of major events during the RA construction.

**Table 3: Chronology of Major RA Construction Events**

| Date | Event |
|---|---|
| April 2007 | EPA provided authorization to proceed with the RA by approving Revision 1 to Addendum No. 1 of the RAP and Compass' Bid Package. |
| May 2007 | Respondents signed contract with Compass. |
| July 2007 | Compass mobilized to the Site on July 5, 2007 to prepare the Site for RA. Compass submitted the E&SC Plan for the outside areas to NCDENR. |
| August 2007 | EPA provided authorization to proceed on excavation activities for the 'outside' areas, and Compass began excavation/stockpile/disposal/backfill operations. |
| September 2007 | Compass began dismantling the Ward building and demolished the tank farm. |
| October 2007 | Golder abandoned EPA monitoring wells MW-01A, MW-02, MW-05, and MW-07 because they were located near or within excavation areas. |
| January 2008 | EPA approved LTTD Plan. |
| March 2008 | Compass mobilized and began erecting components of the LTTD unit. |
| May 2008 | NCDENR provided approval for Compass to operate a temporary contact water treatment plant. |
| June 2008 | Compass started operation of the LTTD unit and conducted the Proof of Performance (POP) test on June 30 and July 1, 2008. |
| July 2008 | Compass began operation of Ward's contact water treatment plant. EPA set interim operating parameters to continue LTTD operations pending approval of POP test results. |

| Date | Event |
|---|---|
| August 2008 | On August 21, 2008, the Respondents submitted a letter to EPA proposing a revision to the RAP for a cleanup level of 10 ppm or less (≤ 10 ppm) PCBs for those portions of the Ward properties within the boundary of Ward's surface water management system covered with one foot of clean material. EPA authorized this revision on August 26, 2008. |
| September 2008 | EPA approved the POP test on September 17, 2008, and Compass began full-scale LTTD operation. |
| October 2008 | Compass demolished the Ward water treatment plant. Compass dewatered the lagoon and divided it into three cells to dry lagoon sediment and soil in preparation for LTTD treatment. |
| March 2009 | Compass began decontamination and demolition of the former Horizon Forest Products building. |
| April 2009 | Compass completed decontamination and demolition of the Horizon Forest building. |
| July 2009 | EPA and NCDENR Superfund Section requested change in Compass' contact water treatment to a batch process. |
| August 2009 | NCDENR Surface Water Protection Section approved contact water treatment batch process on August 10. |
| September 2009 | Compass satisfied permit equivalency requirements of NCDENR to remove the lagoon embankment. Compass built a temporary, geomebrane-lined, closure pond downstream of the Ward lagoon to provide additional contact water storage capacity. |
| December 2009 | Compass temporarily shut down the LTTD unit on December 13, 2009, because of decreased volumes of soil for treatment. |
| January 2010 | A release of contact water occurred from the treatment system due to pipe freezing in extremely cold temperatures. Compass began cleanup of the release. |
| February 2010 | Compass operated the LTTD unit from February 9 through February 19, 2011, and then began demobilizing the unit. |
| March 2010 | Compass submitted the Reach A Reconstruction Plan to NCDENR. |
| April 2010 | Compass decontaminated and disassembled part of the water treatment system. |
| May 2010 | Compass completed the contact water release cleanup and constructed an access road on the RDU property to relocate the wastewater treatment plant to the west of the Estes property. Golder submitted the proposed RA plan for Reach A at I-540 right-of-way (ROW) to NCDOT with a copy to EPA. |
| June 2010 | NCDOT approved the Reach at I-540 RA plan and Compass began RA activities for Reach A at I-540. |
| July 2010 | Compass completed RA along Reach A at I-540. |
| October 2010 | Compass completed installation of the treated soil cover system. |
| November 2010 | With the treated soil cover system completed and no further excavations planned, Compass suspended water treatment operations, began demobilization of the water treatment unit, converted the closure basin to a sediment pond, and began restoration of Reach A. |
| January 2011 | Compass submitted a revised Reach A Reconstruction Plan to NCDENR with changes to the channel grade control structures and the planting plan. |
| February 2011 | NCDENR visited the Site and provided a letter accepting the Reach A reconstruction. |
| March 2011 | On March 28, 2011, representatives of the Respondents, Compass, EPA, and Golder conducted a site walk-through. |
| April 2011 | Compass completed restoration of Reach A. On April 10, 2011, representatives from EPA, NCDENR, and Golder conducted a site walk-through. On April 14, |

| Date | Event |
|---|---|
| | 2011, representatives from NCDOT and Golder conducted walk-through along Reach A at the I-540 ROW. |
| May 2011 | Compass installed a permanent fence along Mt. Herman Rd and demobilized remaining equipment. Compass demobilized from the Site on May 26, 2011. |

## 3.2 Site Preparation

Compass mobilized to the Site in July 2007 and began construction preparation, including Site surveying, clearing, locating utilities, and locating work areas for excavation, stockpiling, treatment operations, and temporary facilities. Until the main Ward building was slated for demolition, the office area was used as the construction office. Afterward, construction office trailers were brought on Site.

The Site was divided into three primary zones: 1) the exclusion zones, 2) the contaminant reduction zones, and 3) the support zone. The exclusion zones included areas where active cleanup operations were performed, areas where PCB-impacted soil and debris were stockpiled, and the area around the LTTD unit. The exclusion zones were separated from the contaminant reduction and support zones by a three-foot high, high-visibility fence. Entrance to the contaminant reduction zones, and subsequently the exclusion zones, were through decontamination pads. The support zones were used for storage and support functions, and included the areas where RA worker parking and the office trailers were located.

Separate staging areas for stockpiles of soil and debris with PCB concentrations < 50 ppm and ≥ 50 ppm were set up with soil berms and/or barriers to form a containment berm. Sump pumps were installed as needed to collect contact water for treatment and discharge. The Ward WTP was used to treat contact water until it had to be demolished as part of the RA, after which Compass operated its temporary water treatment plant. Erosion control measures were implemented to contain sediment and prevent sediment migration during RA activities. The measures were in accordance with the requirements of the NCDENR. Further description of the erosion and sediment control measures is provided in Section 3.7 SPPP Compliance.

Compass retained a local company to perform ground surveying that included setting property boundaries, surveying ground surface elevations, surveying the locations and depths of excavation areas, and surveying grades for site restoration. The excavation locations and final bottom elevations were surveyed by global positioning system (GPS) to a horizontal accuracy of ±3 millimeters (mm) (+0.5 ppm atmospheric correction factor) and a vertical accuracy of ±5 mm (+0.5 ppm atmospheric correction factor) to the North Atlantic Vertical Datum (NAVD), Lambert conformal projection of the Geodetic Reference System GRS 80 Ellipsoid. The surveyed as-built drawings are provided in Appendix C. The drawings include pre-RA topography and Site features, the lateral extent and bottom elevations of the final excavations, and final topography and restoration features of the Site (post-RA conditions).

## 3.3 Soil Excavation Activities

### *3.3.1 Cleanup and Disposal Criteria*

As discussed in Section 2.1, the RA cleanup criteria for the Site were:

- Remove soil and debris with PCB concentrations exceeding 1 ppm from areas not defined by the treated soil final cover system.
- Remove soil with PCB concentrations exceeding 10 ppm from areas defined by the treated soil final cover system.

The disposal and thermal desorption treatment criteria are summarized below:

- Soils and incidental debris less than about 2 inches in diameter with PCB concentrations at or greater than 50 ppm (designated for convenience in this report as TSCA material) were thermally desorbed. Larger debris and some soil that could not be scheduled for thermal desorption was disposed at the Heritage facility.
- Soils and debris with less than 50 ppm PCBs (designated for convenience as Subtitle D material) and painted steel designated as PCB bulk product waste were disposed at the Sampson County Disposal.

### *3.3.2 Sequence of Excavation*

As required by EPA and specified in the RAP and the Excavation Plan, the excavation began by addressing the outside areas—areas not within Ward's surface water management system. The outside areas included the front portion of the Ward Transformer facility, the front portion of the Horizon Forest Products property, the front portion of the former Visara International property, Mt. Herman Road, the Gravel Lot, the northeast portion of the Estes facility, and the impacted property northwest and west of the Ward Transformer property including Reach A. The outside areas were excavated and backfilled to approximately the original ground surface elevations with clean, compacted fill obtained from off-Site sources. Once the outside areas were well under way, soil excavation proceeded to the inside area on the Ward properties.

Excavation proceeded from up-gradient areas to down-gradient areas to prevent impacted sediments from potentially being mobilized and re-deposited in areas that had been excavated and backfilled. Excavations left open were marked and temporary barriers erected to prevent accidental entry. Surface water control measures were implemented to prevent run-on and run-off of storm water from open excavations.

Excavation at the Site was based on PCB concentration criteria for treatment and disposal. Excavations began at locations where delineation sampling indicated PCBs at or greater than 50 mg/kg and were then expanded, as necessary, into surrounding areas where samples indicated PCBs to be less than 50 mg/kg. This approach was taken so that removal of the TSCA material would be verified by sampling and analysis (verification sampling) of the remaining excavation area's floors (bottoms) and walls before material was removed for off-site disposal at the Subtitle D facility. Excavated TSCA soils were stockpiled

for thermal treatment. Subtitle D soils were stockpiled for loading or direct-loaded onto trucks for transport to Sampson County Disposal.

The lagoon sediment consisted primarily of TSCA material that required solidification and stabilization prior to thermal treatment. The lagoon was divided into three cells by using soil berms to isolate and dewater the pond. Contact water was transferred from the point of initial collection into a portable tank (called the Econo tank) erected on the facility. A geomembrane-lined basin (called the closure pond) was constructed downstream of the lagoon to provide additional contact water storage capacity as the lagoon was dewatered. Drier TSCA soil from other areas of the Site and lime was added and mixed with the wet sediment for handling and to develop suitable feed moisture content for the LTTD unit.

### *3.3.3 Additional Delineation Sampling*

At the beginning of the RA, delineation sampling and analysis beyond that done during the RI was conducted in accordance with the requirements of the Settlement Agreement. As the RA construction continued, delineation sampling and analysis were also continued to guide excavation and thermal treatment planning because the lateral and vertical excavation extents of PCB-impacted material were expanding. Delineation sampling was performed in general accordance with the QAPP using hand tools or a direct-push technology (DPT) drill rig. The locations and results of the delineation sampling are shown on Figures D-1 to D-8 in Appendix D (note that these figures also show Phase 2 delineation sampling that was completed during the Phase 1 RA). Initially, the Site was divided into sampling stations as shown in the RAP. These sampling stations were refined during the RA construction to those shown on Figure D-1. The stations are:

- Horizon Forest Property
- Horizon Forest Building
- Ward Front
- Ward Back
- Ward Building
- Around Lagoon
- Lagoon
- Gravel Lot
- Mt. Herman Rd
- Mt. Herman Rd East
- North Area
- West Area
- Reach A
- Estes Trucking
- RDU-South

The sampling logs are provided in Appendix E-1, divided into the sampling stations.

In addition to PCB delineation sampling, samples for Oil and Grease (O&G) were collected and analyzed to satisfy Sampson County Disposal's limit of 3,000 mg/kg O&G. Samples were analyzed using SW-846 Method 9071 at a frequency of approximately one sample per 500 cubic yards disposed.

### *3.3.4 Verification Sampling*

Initial excavation areas were subdivided into approximately 50-foot by 50-foot sampling areas (2,500 square feet). After an initial excavation was completed, verification samples were collected from sidewalls and from the floor of the excavation. The sample location and collection requirements were as follows:

- For the bottom area, quadrants were established. A composite sample was collected from discreet samples (grab points) obtained from the center of each of the four quadrants. The grabs were collected from a depth of 0 to 3 inches.
- For side walls, a composite sample from four grab points was collected with each grab located every 50 linear feet along each side wall. The grabs were spaced between 10 and 15 feet apart along the 50-foot length of wall. The samples were collected from a depth of 0 to 3 inches into the wall.

If the prescribed cleanup level was exceeded, the following procedures were followed:

- For bottom composite sample exceedance within a sampling area, grab samples were analyzed from the four points from which the composite sample had been generated to establish which point(s) contributed to the exceedance. Upon determination of that point(s), a 25-foot by 25-foot area, one foot deep, and centered around the impacted point(s) was excavated. One additional verification sample was collected from the base of this excavation. This additional sample was comprised of five aliquots collected from the center of the expanded excavation bottom and between the center of the excavation and each side wall. This procedure was repeated until the excavation met equipment refusal or until the results were below the prescribed cleanup level.
- For a side wall composite sample exceedance, grab samples were taken from the locations of the four points (spaced between 10 and 15 feet apart) from which the composite samples had been generated to establish which point(s) contributed to the exceedance. Upon determination of that point(s), the excavation was expanded in that direction a distance of 2 feet centered on the point(s) location for a lateral distance of approximately 20 feet. At some locations, the excavation was expanded more than 2 feet based on surrounding excavation areas results. Following the additional excavation, additional composite samples were collected from the newly exposed floor and side walls. This procedure was repeated to refusal or until the results were below the prescribed cleanup level.

The verification samples were field-screened for PCBs using the immunoassay method by SW-846 Method 4020. Typically, field-screening was conducted at two levels. The first was at the cleanup level to determine whether the clean-up criterion was met, which was 1 ppm for excavations outside the approximate area of Ward's surface water management system and 10 ppm for inside the area (effective August 8, 2009). The second screening level was at 50 ppm to determine the appropriate disposal/

treatment requirements for expanded excavations. Some verification samples were also split and analyzed by PCB laboratory method SW-846 Method 8082.

In some instances, the work required that temporary stockpiles be created before characterization samples could be taken. In these instances, each stockpile was subdivided into portions of about 200 cubic yards in volume and one composite sample was taken from each for disposal characterization. Each composite sample was comprised of six sub-samples obtained from two borings or hand probes in each 200-cubic yard portion (three sub-samples from each boring/probe). The depths of the sub-samples were selected to provide sample material from near the top, the interior and near the bottom of the stockpile. Stockpile samples were also analyzed for PCBs using field-screening and/or laboratory method.

Figure D-9 in Appendix D shows these approximate final excavation depths in feet below original ground surface (prior to RA construction) measured during sampling. Verification sampling logs are provided in Appendix E-2, divided by the sampling stations.

#### 3.3.4.1 Quality Assurance/Quality Control

Field, laboratory, and data evaluation procedures were completed in general accordance with the QAPP. QC practices used to evaluate data quality indicators included the use of accepted analytical procedures, adherence to hold time, and collection and analysis of duplicate and spiked quality control samples. PCB field-screening analyses were performed by Genesis Project Inc., and laboratory analyses were completed by CompuChem. The frequency of QC duplicate samples for verification and delineation soil sampling for PCB analyses during the RA is summarized in Table 4.

**Table 4: QC Duplicate Sample Frequency for Verification and Delineation PCB Soil Sampling**

| Types of Samples | Number of Samples | QC Requirements | Actual QC Frequency |
|---|---|---|---|
| Primary | 13,140 | N/A | N/A |
| Duplicate | 817 | 1 for every 20 Primary Samples | 1 for every 16 Primary Samples |

Field-screening data are provided in Appendix F, laboratory reports are in Appendix G, and data validations are in Appendix H.

Two corrective actions were conducted during the verification and delineation sampling programs. The first corrective action was to discontinue use of the Strategic Diagnostic, Inc., (SDI) Rapid Assay PCB Test Kits (Rapid Assay) for PCB field-screening, as described in a letter to EPA included in Appendix I-1. The second was to refine the tracking process for sample receipt and analyses for the field laboratory, as described in a technical memorandum included in Appendix I-2.

### 3.3.5 PCBs Left-in-Place

It was anticipated during the RA planning that some excavations would be deep enough to encounter the top of partially weathered rock or hard rock. As stated in the RAP, excavation of weathered and/or hard rock was limited to material that could be removed using a Caterpillar Model 320 excavator or equivalent. When excavation refusal was encountered, the excavation bottom was scraped to remove as much loose material as was practicable and verification samples of the loose material were collected for PCB laboratory analyses. Areas of excavation refusal with PCBs remaining above the cleanup criterion were covered with a geotextile as a marker layer and then backfilled. These locations of PCBs left-in-place in areas of excavation refusal are shown on the as-built drawings provided in Appendix C and are summarized on Figure D-10 in Appendix D.

In addition, there is a short section (about 10 feet in length) along the fence line at I-540 in the North Area station where PCBs at 1.8 ppm were left in place in soil at 3 feet below ground surface. Excavation of this area may have required partial lane closing of I-540 and the I-540 fence line was set as the boundary in the RAP. There are also PCBs in soil left in place at the Estes facility and within the I-540 ROW at the confluence of the surface water course from RDU-South and Reach A as shown on Figure D-10. At Estes, excavation at the northeast portion of the facility was limited to shallow depths of 2 to 5 feet to minimize interruption to Estes' operations. Excavation of Reach A within the I-540 ROW was terminated near the confluence of the Reach A and the RDU property surface water drainage course and there is a short section (about 15 feet in length) where PCBs at 2.0 ppm were left in place at 2 feet below ground surface at the end of the end of the excavation. Both of these areas are planned to be addressed as part of Phase 2 of the RA.

### 3.3.6 Well Abandonment

On October 19, 2007, Golder abandoned four (4) groundwater monitoring wells (MW-01A, MW-02, MW-05, and MW-07) that had been installed during the Remedial Investigation and Risk Assessment (Weston, 2004) and the water supply well (WW-1) at the Ward facility because they were located near or within planned excavations. The well locations shown on Figure 2 and the abandonment logs are provided in Appendix J.

## 3.4 Low-Temperature Thermal Desorption (LTTD) Operations

### 3.4.1 General Operations

The LTTD unit consisted of a soil feed system, thermal desorber, auxiliary air intake, baghouse, induced draft fan, thermal oxidizer, burner systems, quench, acid gas scrubber, and control trailer. Compass mobilized the equipment in March 2008 and began pre-production activities of the unit in June 2008, as described in the LTTD Plan. The pre-production period included start-up, shake-down, preliminary tests to verify that soil treatment and air emissions requirements would be met, and a formal POP test to

establish operating conditions to meet air emissions requirements. Demonstrating that the LTTD unit would meet the soil treatment standards was part of the pre-production phase, but not part of the formal POP test. As agreed with EPA, a treated soil sampling and analysis program was also conducted during the pre-production period to evaluate PCB concentration measurements by field immunoassay analysis, Aroclor laboratory analysis, and homolog laboratory analysis, and dioxin (TEQ) concentrations by laboratory analysis against the following treatment criteria:

**Table 5: LTTD Treatment Criteria**

| Parameter | Disposal |
|---|---|
| PCBs | 1 mg/kg (ppm) |
| Dioxin/Furans (TEQ) | 1 ug/kg (ppb) |

During start-up, Compass tested the electrical and mechanical subsystems of the LTTD unit as well as the safety interlocks of the burner management system to ensure proper operation. Once the unit was operating within normal conditions, Compass began to process material through the unit to verify compliance with both air emission and soil cleanup criteria in preparation for the POP test and full-scale operations. Compass conducted the POP test on June 30 and July 1, 2008. The results of the POP test are summarized in Table 6, and the POP Test Report is included in Appendix K.

**Table 6: POP Test Results**

| Parameter | Performance Standard | Test Run #1 | Test Run #2 | Test Run #3 |
|---|---|---|---|---|
| **Test Result (Pass/Fail)** | | **Pass** | **Pass** | **Pass** |
| ***Stack Emissions*** | | | | |
| Particulates (a) | ≤ 0.08 gr/dscf | 0.008 | 0.004 | 0.007 |
| Carbon Monoxide (a) | ≤ 100 ppm | 0.41 | 0.38 | 0.45 |
| Combustion Efficiency | ≥ 99.9% | 99.9996 | 99.9996 | 99.9996 |
| Nitrogen Oxides | ≤ 120 lb/hour | 9.18 | 9.25 | 8.52 |
| Hydrogen Chloride and Chlorine | > 99% HCl removal or ≤ 4 lb/hr HCl emissions | 0.05<br><5.9E-04 | 0.02<br>0.01 | 0.09<br><5.2E-04 |
| PCDD/PCDF | <0.4 ng/dscm (see note) | 0.03 | 0.03 | 0.03 |
| ***Equipment Performance Standards*** | | | | |
| PCB Destruction and Removal Efficiency via Mono-Chlorobenzene Surrogate | ≥99.9999% | 99.999998% | 99.999996% | 99.999996% |
| ***Treated Soil*** | | | | |
| PCBs | 1 mg/kg | 0.069 | 0.068 | 0.060 |
| 2,3,7,8 TCDD TEQ | 1 µg/kg TEQ | 0.348 J | 0.261 J | 0.262 J |

Note: Total tetra- through octa- chloronated PCDD/PCDF corrected to 7% oxygen.

Based on its review of the POP test and initial operations, EPA authorized operation of the unit using the interim operating parameters provided in Table 7. The POP test report was submitted to EPA on August 8, and approved by EPA on September 17, 2008, after which full-scale (production) operations began using the production operating parameters listed in Table 7.

**Table 7: LTTD Operating Parameters**

| Parameters | Interim | Production | AWFSO Conditions |
|---|---|---|---|
| Soil feed rate (tons per hr) | 35.0 | 39.7 | 60-minute rolling average |
| Thermal desorber pressure (inches w.c.) | <=-1.0 | <=-1.0 | 15-second delay |
| Thermal desorber gas outlet temperature (°F) | <400 | <400 | Instantaneous |
| Baghouse differential pressure (inches w.c.) | 1.0 | 1.0 | Instantaneous |
| High gas flow - induced draft fan amperage (amps) | 180.0 | 180.0 | Instantaneous |
| Thermal desorber gas outlet temperature (°F) | 1900 | 1890 | Instantaneous |
| Scrubber Flow (gpm) | 650 | 650 | Instantaneous |
| Scrubber pH | >=6 | >=6 | 5-minute delay |
| Stack gas oxygen concentration (%) | >3.0 | >3.0 | Instantaneous |
| Stack gas carbon monoxide (ppm) | <=100 | <=100 | 5-minute delay |

Note: AWFSO (automatic waste feed shut off) would be triggered if the operating conditions were outside the established limits.

The LTTD unit ran 24 hours per day, seven days per week except for maintenance down time and shut-down periods for holidays until December 13, 2009, when the unit was temporarily shut down for lack of soil to treat. The unit was re-started on February 9, 2010, and operated through February 19, 2010, after which time the unit was demobilized from the Site. A summary of the LTTD operation is as follows:

**Table 8: LTTD Operations Summary**

| Item | Quantity |
|---|---|
| Calendar Days without December 2009 to February 2010 Shut-Down | 567 |
| Operating Days | 408 |
| Operating Hours | 9,789 |
| Treated and Passed (tons) | 304,712 |
| Average Throughput (tons/hour) | 31.1 |
| Lime for Moisture Reduction (tons) | 3,194 |
| PCB Soil and Miscellaneous Debris Treated | 301,518 |

### *3.4.2 Material Staging and Handling*

Excavated/stockpiled materials designated for LTTD treatment were transported to an interim staging area for size screening and moisture control by mixing with drier soil and/or lime. Oversized debris (> 2 inches) was staged for off-Site disposal at the Heritage facility. After screening and moisture preparation, the material was transported to the waste feed pad area for thermal treatment.

The treated soil was staged in discreet stockpiles in bins designed for a maximum of 1,000 tons of material, each approximately the maximum amount that could be treated in 24-hours at full production. The treated soil was held in these day-piles until PCB analysis confirmed that the soil met the < 1 ppm treatment criterion. Treated soil not meeting the treatment criterion was returned to the waste feed area for further treatment. Treated soil meeting the treatment criteria was stockpiled for later use as backfill on the Ward property within the approximate area of the surface water management system.

### *3.4.3 PCB Treated Soil Testing*

During the shakedown period, ten treated soil samples were collected for comparative PCB analyses to determine analytical method(s) to be used during production treatment to verify that the treated soil met the < 1 ppm criterion. Split samples were analyzed by field immunoassay screening (SW-846 Method 4020), laboratory quantitative analysis for Aroclors (SW-846 Method 8082), and laboratory quantitative analysis for homologs (EPA Method 1668A). The comparison results are presented in Appendix L. The homolog results were, on average, 4.5 times higher than the laboratory Aroclor results meaning that homolog analysis could yield treated soil PCB concentrations greater than the 1 ppm criterion when the immunoassay screening and Aroclor methods yielded < 1 ppm. However, the laboratory's turn-around time for homolog analysis extended to weeks, which was impractical for treated soil compliance testing, especially at the Ward Site where there was limited space for storing treated soil while awaiting test results. To be able to continue with the LTTD treatment approach, the Trust proposed a revised cleanup level of 10 ppm applicable within the approximate boundary of Ward's original surface water management system. For the treated soil this criterion was considered to have been met with immunoassay screening or laboratory Aroclor analysis methods yielding results < 1 ppm PCBs. If an immunoassay test exceeded the < 1 ppm PCB treatment criterion (see Table 5), the sample was also tested in the laboratory by the Aroclor method and the laboratory Aroclor result was used to compare to the treatment criterion. In some cases, the soil was re-treated without running the laboratory test.

While awaiting EPA-approval of the POP test results, one composite sample was taken from the treated soil bins for each day of full 24-hour operation for PCB analysis by field immunoassay screening. The composite sample consisted of six (6) aliquots taken from the LTTD unit conveyor spaced at approximately four (4) hour intervals. If the sample results met the < 1 ppm treatment criterion, the treated soil represented by that sample was stockpiled for later use as on-Site backfill. If the results did not meet the criterion, the treated soil represented by that sample was re-treated and re-tested. The pre-production treated soil results are summarized in Table M-1 in Appendix O, and the sampling logs are included in Appendix M.

During the production period, composite sampling continued for PCB field-screening with one composite sample taken for each day of full 24-hour operation. The production treated soil results are summarized in Table M-2 in Appendix M, and the sampling logs are included in Appendix M. As required, one sample

was split for Aroclor analysis for every 10 immunoassay tests, and the numbers of tests are summarized in the Table 9.

**Table 9: QC Split Sample Frequency for PCB Treated Soil Sampling**

| Types of Samples | Number of Samples | QC Requirements | Actual QC Frequency |
|---|---|---|---|
| Primary | 397 | N/A | N/A |
| Duplicate | 45 | 1 for every 10 Primary Samples | 1 for every 9 Primary Samples |

### *3.4.4 Dioxin/Furan Treated Soil Testing*

Ten treated soil samples were collected during the pre-production period for dioxin/furan (collectively called dioxin) analyses by SW846 Method 8290. The dioxin analyses results were used to determine whether the dioxin treatment criterion of 1 ppb TEQ (part per billion toxic equivalents, TEQs) relative to 2,3,7,8-tetrachlorodibenzodioxin (TCDD) had been met. TEQs were calculated using the 2005 World Health Organization (WHO) toxicity equivalent factors (TEFs). Detected TCDD congeners were multiplied by their respective TEF for the TEQ calculation. If a TCDD congener was reported as not-detected then the estimated detection limit (EDL) was multiplied by its respective TEF in the TEQ calculation. If a TCDD congener was reported as a maximum possible concentration (MPC) value, then one-half of the MPC was multiplied by its respective TEF in the TEQ calculation. The TEQ calculations are summarized in Table M-3 in Appendix M. Table O-3 also includes the results from treated soil samples collected during the POP test.

All dioxin results passed the treatment criterion, except the result from the sample collected on the first day of pre-production treatment of PCB-impacted soil. Failure of this sample was ascribed to the potential for it having been taken before the drum had fully reached operating temperature. The treated soil from this first day was re-treated and re-tested. Treated soil meeting both the dioxin and PCB criteria was stockpiled for later use as on-Site backfill.

During the first four weeks of routine LTTD production one sample per week was collected for dioxin analysis. The results indicated that production treatment consistently met the treatment standard of 1 ppb TEQ, and the dioxin testing was discontinued as agreed by EPA. The treated soil production results are summarized in Table M-4 in Appendix M, and the sampling logs are in Appendix M.

## 3.5 Backfilling and Off-Site Borrow

Excavations on properties owned by parities other than a Ward entity were backfilled to approximately their original grades with clean soil from off-Site borrow sources. The Ward entity properties were backfilled with a combination of treated soil and off-Site borrow. The treated soil was backfilled within the approximate area of former surface water management system, the outline of which is shown on Figure 2.

The treated soil backfill was covered with a geotextile marker layer and one foot of off-Site borrow soil to support grass vegetation. The final grades of the treated soil and cover, although different than the ground surface topography during Ward's operations, divide and direct surface water flow approximately the same as during Ward's operations. The final cover grades are shown on the as-built drawings provided in Appendix C.

The off-Site borrow was obtained from the following commercial sources:

- TS-1 – Topsoil from American Soil and Mulch, Cary, NC
- OB-1 - Overburden soil from Wake Stone Company, Cary, NC
- PF-1 – Processed Fill (crushed quarry rock) from Wake Stone Company, Cary, NC
- MM-1 – Overburden soil from Raleigh-Durham Quarry, Martin Marietta Materials Inc., Raleigh, NC
- ASGP-1 – Soil from Cambria Suites excavation at 300 Airgate Drive, Morrisville, NC
- TS1-BC-TRILS – Topsoil from 9101 Bruckhas St., Raleigh, NC
- PR-1 – Page Road Garden Center, Morrisville, NC

Off-Site borrow materials were sampled and analyzed by CompuChem Laboratories for the following Target Analyte List and Target Compound List (TAL/TCL) parameters:

**Table 10: Off-Site Borrow Analyses**

| Parameters | Method |
|---|---|
| Volatile Organic Compounds (VOCs) | SW8260 |
| Semi-volatile Organic Compounds (SVOCs) | SW8270 |
| Metals (total concentrations) | SW6010 and SW7471 |
| PCBs | SW8082 |

Analyses results and NCDENR borrow source acceptance are provided in Appendix N.

### *3.5.1 Compaction Testing*

In accordance with the CQAP, compaction testing was conducted for both off-Site borrow and treated soil backfill. Compaction testing was conducted a frequency of 1 test per 5,000 cubic yards placed. The results are presented in Appendix O.

## 3.6 Building Demolition

As part of the RA, the following structures on the Ward properties were demolished:

- Tank farm
- Ward Transformer building
- Ward Water Treatment plant
- Former Horizon Forest building

The tanks in the tank farm were decontaminated and sampled for PCBs with sample results meeting unrestricted use category. The tanks were disposed as scrap metal at TT & E Iron & Metal Inc. of Garner, NC, and the receiving tickets are provided in Appendix A-5. For the buildings, bulk and wipe samples were collected throughout from various materials and equipment, and the disposal criteria were developed, as described below.

The sampling results and the disposal characterization and sampling logs for the Ward Transformer building, the Ward Water Treatment Plant, and the former Horizon Forest building are provided in Appendix P.

### *3.6.1 Steel Disposal Criteria*

Steel structural elements were either disposed at Sampson County Disposal for Subtitle D-characterized waste or at Heritage Disposal Facility for TSCA-characterized waste using wipe sample results. The disposal criteria using wipe sample results were as follows:

**Table 11: Painted Steel Wipe Sample Disposal Criteria**

| PCB Concentration | Disposal |
|---|---|
| < 100 µg/100 $cm^2$ | Sampson County |
| ≥ 100 µg/100 $cm^2$ | Heritage |

The majority of the steel from both the Ward Transformer and former Horizon Forest buildings was painted. Disposal was based on PCB concentrations both in the paint and on the paint because the paint is considered a porous surface by TSCA regulations. The PCB results of the bulk paint samples and the wipe samples did not conclusively indicate the origin of the PCBs in the paint. However, the high PCB concentrations in paint from non-production areas of the Ward Transformer building and from the former Horizon Forest building where operations would not have been expected to have caused PCBs to be absorbed into the paint, particularly in areas near the roof, indicated that the PCBs were likely in the paint when it was applied. Therefore, as agreed by EPA, the painted steel was classified as *PCB bulk product waste* per the TSCA regulations at 40 CFR 761.3. As such, the painted steel with PCBs ≥ 50 ppm from bulk samples was disposed at the Sampson County Disposal facility as per 40 CFR 761.62(b)(4). The disposal criteria for the PCBs on the painted surface of the steel were based on wipe sample results listed in Table 11.

Where PCB wipe sample results were ≥ 100 µg/100 $cm^2$, additional cleaning with a detergent or solvent solution and a rinse was conducted to reduce residual PCBs to levels meeting the Subtitle D disposal criterion. Also, additional location-specific sampling (e.g., sampling individual columns in a group) was conducted to reduce the number of steel members with **final results** ≥ 100 µg/100 $cm^2$ PCBs.

The loose paint chips removed from the painted steel with PCBs ≥ 50 ppm and paint chips from the loading dock area that contained lead were containerized for incineration at Veolia ES Technical Solutions, Port Arthur, Texas.

### *3.6.2 Demolition Debris Disposal Criteria*

Demolition debris was characterized for disposal based on wipe sample results for non-porous surfaces and bulk sample results for porous materials.

As agreed with EPA, the PCB contamination on miscellaneous building materials in the office areas of the buildings was considered to be incidental. Since bulk sampling was impracticable for many of the items (e.g., painted file cabinets, desk tops, etc.), wipe sampling was considered to be acceptable since the material was to be disposed in a landfill and since there was no expectation that the paints were originally made with PCBs (as with the older industrial, structural steel paints). Where PCB wipe sample results were ≥ 100 µg/100 $cm^2$, additional cleaning with a detergent or solvent solution and a rinse was conducted to reduce residual PCBs to meet the Sub D disposal criterion. Materials disposed in this manner included the following:

- Glass
- Oil transfer piping
- Un-painted steel
- Miscellaneous materials from non-production areas within the building, such as:
  - Porcelain, including wall tile and grout
  - Office wood paneling
  - Furnishing and shelving (except for carpet)
  - Painted metal cabinets
  - Bathroom fixtures
  - Paper and office supplies

The disposal criteria using wipe sample results were as follows:

**Table 12: Demolition Debris Wipe Sample Disposal Criteria**

| PCB Concentration | Disposal |
|---|---|
| < 100 µg/100 $cm^2$ | Sampson County |
| ≥ 100 µg/100 $cm^2$ | Heritage |

Porous debris and debris with porous surfaces were characterized for disposal based on results of bulk samples. Materials disposed under the bulk sample disposal criteria included the following:

- Concrete
- Block, brick and mortar

- Horizon Forest warehouse area insulation and plywood wall covering
- Ceiling tile
- Carpet

The disposal criteria using bulk sample results were as follows:

**Table 13: Demolition Debris Bulk Sample Disposal Criteria**

| PCB Concentration | Disposal |
|---|---|
| < 50 ppm | Sampson County |
| ≥ 50 ppm | Heritage |

### *3.6.3 Asbestos-Containing Materials*

Prior to demolition activities, surveys were conducted to determine if there were asbestos-containing materials (ACMs) in the buildings. The results of the surveys are provided in Appendix Q. ACMs were found in the Ward Transformer building and asbestos abatement was conducted in February 2008. Wipe samples were used to determine final disposition based on PCB contamination since grinding ACMs to obtain bulk samples for testing would itself be hazardous. The ACM wipe sample results were < 100 µg/100 $cm^2$; therefore, ACM debris was disposed in the Sampson County Landfill.

## 3.7 Stormwater Pollution Prevention Plan Compliance

### *3.7.1 Erosion and Sediment Control*

Erosion and sedimentation controls were implemented during the RA. General controls were implemented as needed when localized control was necessary. The general controls consisted of both stabilization and structural practices, as provided in the Example Erosion and Sediment Control Plan for the Ward Transformer Superfund Site dated September 2009, such as controlling dust and installing temporary sediment traps, silt fencing, check dams, inlet and out protection, and temporary and permanent seeding.

Construction-specific controls were implemented at locations of major site work outside of the Ward surface water management system. The Ward surface water management system was used for areas within its boundaries. Compass submitted an E&SC Plan to NCDENR meeting the required permit equivalency, as provided in Appendix R. In preparation for the lagoon excavation, Compass also satisfied permit equivalency requirements of NCDENR to remove the Ward lagoon dam. This included a temporary geomembrane-lined pond (called the closure basin) downstream of the Ward lagoon to provide contact water holding capacity. The plans submitted to NCDENR are provided in Appendix S. The as-built drawing of the closure basin is provided in Appendix T along with the quality control/quality assurance monitoring and testing conducted for basin construction.

Inspections and E&SC maintenance were conducted in accordance with the SPPP. A maintenance inspection report was completed after each inspection. The inspection reports are provided in Appendix U.

### *3.7.2 Contact Water*

Surface water that may have contacted PCB-containing material (contact water) at stockpiles, excavations, and demolition areas was collected and treated for discharge. The Ward facility WTP was used to treat contact water until it had to be demolished as part of the RA, after which Compass provided and operated a temporary treatment plant beginning in July 2008. Compass operated its temporary plant under the Ward Transformer NPDES permit, number NC0045608, initially using the lagoon for storage of contact water. Because the contact water storage capacity in the Ward lagoon was reduced as excavation proceeded, Compass installed a 250,000-gallon modular tank (Econo tank) for the storage of contact water. Later, after the lagoon was eliminated, the closure basin was used to provide additional storage capacity. The NCDENR permit equivalency approval for the Compass system, dated May 29, 2008, is provided in Appendix V, along with the monthly discharge monitoring reports submitted to NCDENR. NCDENR's rescission of the Ward's NPDES permit, effective February 11, 2011, is also included in Appendix V.

#### 3.7.2.1 Compass WTP Corrective Action

Compass conducted a corrective action in June and July 2009 for its WTP because the monthly composite sample for the May 2009 reporting period exceeded the PCB discharge limit. The treatment process, as agreed with EPA and NCDENR, was changed to a test-and-release process (batch process) to assure there were no future exceedances of the discharge limits. Results of the corrective action and approval from NCDENR are provided in Appendix V.

### *3.7.3 Equipment Decontamination*

Compass separated equipment used for handling PCB-containing soil and debris from the equipment used for handling clean backfill and other materials. Compass maintained decontamination pads at the exits of the exclusion zones. Equipment used in the exclusion zones was decontaminated and wipe-tested for PCBs prior to leaving the Site. The decontamination pads were built with a rinsate recovery system to collect the rinse water for treatment with contact water.

The equipment decontamination results are presented in Appendix W. For decontamination, the equipment was categorized as:

- Earthwork equipment
- LTTD unit equipment
- WTP equipment

- Stockpile concrete barriers
- Miscellaneous equipment

Miscellaneous equipment included office trailers, geoprobes for delineation sampling, and equipment used to demolish buildings and structures.

### *3.7.4 Contact Water Release*

On January 7, 2011, a release of contact water occurred at the Econo tank. Because of freezing temperatures, Compass was continuously circulating contact water to keep the piping system from freezing. During the early morning hours, a hose from the treatment tanks to the Econo tank broke away from the Econo tank and contact water was released into the secondary containment which overflowed into the former lagoon, where treated soil was being backfilled, and onto the Estes property. The aerial extent of the overflow is shown on Figure X-1 in Appendix X. Upon discovery of the release, Compass immediately implemented the following measures:

- Stopped water re-circulation to the Econo tank
- Pumped released contact water back into the Econo Tank
- Repaired the secondary containment of the Econo tank
- Installed a pump in the culvert between Ward lagoon and Estes to pump water into the lined closure basin
- Excavated soil from areas in the Estes parking lot where contact water had flowed and backfilled the excavations with clean gravel

Golder collected samples to verify that the contact water release impacts were cleaned up to meet the Site criteria. The results of the sampling are presented in Appendix X.

## 3.8 Restoration

Restoration of the outside areas, including those on the Ward Transformer property, was completed as soon as was practicable after the excavations were completed. Restoration of properties not owned by Ward were made in-kind (e.g., vegetated areas with vegetation, paved areas with paving, etc.) and to their approximate original grades. Vegetated areas were seeded, fertilized, and mulched in accordance with the E&SC Plan. Fences removed for entry were replaced at the locations from which they were removed. Mt. Herman Road was backfilled and re-paved per the requirements of the North Carolina Department of Transportation (NCDOT).

For Reach A and the West Area (riparian zone), reconstruction was conducted in accordance with the plan in Appendix Y. This plan was approved by NCDENR on March 22, 2011, and is included in Appendix Y. Reconstruction included installing a rip-rap lined channel and planting select hardwood trees and a custom-blend grass mix.

Excavated areas of the Ward property within the outside area was restored with mostly a gravel surface, but with some grassed areas. The overall surface water drainage pattern of the property was not changed with respect to drainage volume.

Treated soil was used to backfill the inside areas of Ward's property. The treated soil was covered with a geotextile fabric as a marker layer and covered with a foot of off-Site soil with a grass vegetation cover. The final surface of this treated soil cover was graded to manage surface water runoff and reduce the potential for erosion in accordance with applicable regulations.

The restoration as-built drawings are presented in Appendix C.

### *3.8.1 Completion Walk-Through*

A Site walk-through for substantial completion was conducted on March 28, 2011, with representatives from the Respondents, Compass, EPA, and Golder. Additional walk-throughs were conducted with NCDENR and NCDOT on April 10, and 14, 2011, respectively. Incomplete and defective items, generally relating to erosion and sediment control measures, were addressed and completed by May 26, 2011.

### *3.8.2 Reach A and West Area (Riparian Zone) Monitoring*

Monitoring of Reach A and its riparian zone (West Area) is being conducted until 2014 and includes an assessment to identify areas of erosion and to estimate the survival rate of the planted vegetation. Reports are submitted in the fall of each year to EPA and NCDENR.

## 4.0 CLOSING

The Phase 1 RA was conducted in accordance with the RAP and its supporting documents submitted to and with concurrence from EPA. Outside of Ward's original surface water management system, the RA met the cleanup criterion of less than 1 ppm PCBs by immunoassay or laboratory Aroclor analysis methods, except at locations where excavation refusal was encountered before the criterion was met and at locations on the Estes facility and at the confluence of the surface water course from RDU-South and Reach A near I-540 that are planned to be addressed in Phase 2. Inside of Ward's surface water management system, the RA met the cleanup criterion of less than 10 ppm PCBs, which for the treated soil was considered to have been met at less than 1 ppm PCBs by immunoassay or laboratory Aroclor analysis methods. The treated soil has been backfilled on the Ward Transformer property within the approximate area of Ward's original surface water management system and covered with a geo-fabric marker layer, one foot of off-Site borrow soil, and a vegetation cover. The Ward Transformer building, the oil tank farm, the water treatment plant, and the former Horizon Forest Products building have all been demolished. Building demolition debris and soil above the cleanup criteria that was not treated have been disposed of off-Site at approved RCRA disposal facilities based on the following concentrations:

- Subtitle D – PCB remediation waste ≥ 1 ppm, < 50 ppm (< 100 µg/100 $cm^2$ for non-porous surface wipe sample results)
- Subtitle D – PCB Bulk Product Waste (painted steel also meeting < 100 µg/100 $cm^2$ for non-porous surface wipe sample results)
- Subtitle C – PCB remediation waste ≥ 50 ppm (≥ 100 µg/100 $cm^2$ for non-porous surface wipe sample results)

In summary, the RA addressed the four main areas requiring immediate attention that were listed in EPA's Enforcement Action Memorandum, which was part of the Settlement Agreement, as follows:

- Risk to Current Employees
  - Ward ceased operations, the facility has been demolished, and the demolition material disposed off-Site.
- Uncontrolled PCB-impacted sediment in runoff in front of the Ward Main Building
  - Uncontrolled runoff of PCB-impacted sediment has been eliminated. The PCB-impacted soil and concrete has been removed and replaced with clean off-site backfill. This includes part of Mt. Herman Road and the road drainage ditch.
- Uncontrolled PCB-impacted sediment in runoff to Reach A
  - Uncontrolled runoff of PCB-impacted sediment has been eliminated. PCB-containing soil at the Ward site has been removed and/or treated and treated soil remaining on-Site has been covered to establish vegetation to reduce the potential for erosion.
- Storm Water Lagoon
  - Impacted soil within the lagoon and its embankment has been removed and/or treated. There is no longer a need for the surface water management system.

EPA has indicated that it will determine, at an appropriate time in the future, whether and to what extent it is feasible in the form of institutional controls to address any remaining PCB soil contamination in excess of 1 ppm, including PCBs left-in-place at excavation refusal.

## 5.0 CONTACT INFORMATION

The following table provides the contact information for the RA construction:

**Table 14: Removal Action Contact Information**

| | |
|---|---|
| EPA Remedial Project Manager | Luis E. Flores<br>USEPA Region 4<br>13th Floor Atlanta Federal Center<br>61 Forsyth Street, SW<br>Atlanta, GA 30303-8960<br>Telephone: (404) 562-8807 |
| Respondents' Project Coordinator | William G. Weir<br>CONSOL Energy Inc.<br>1000 Consol Energy Drive<br>Cannonsburg, PA 15317-6506<br>Telephone: (724) 485-4604 |
| Supervising Contractor | Primary Contact: Gary Collison, Project Director<br>Golder Associates Inc.<br>3730 Chamblee Tucker Road<br>Atlanta, GA 30341<br>Telephone: (770) 496-1893 |
| Removal Action Contractor | Primary Contact: Leonard Gackowski, Project Manager<br>WRScompass<br>2305 West Park Place Blvd, Suite L<br>Stone Mountain, GA 30087<br>Telephone: (770) 879-4107 |
| Laboratories | CompuChem<br>501 Madison Avenue<br>Cary, NC 27513<br>Telephone: (919) 379-4000<br><br>SGS Environmental Services Inc.<br>5500 Business Drive<br>Wilmington, NC 28405<br>Telephone: (910) 350-1903<br><br>Golder Associates Inc.<br>3730 Chamblee Tucker Road<br>Atlanta, GA 30341<br>Telephone: (770) 496-1893 |

## 6.0 CERTIFICATION

The following 'certification' is provided as required by the Settlement Agreement:

> Under penalty of law, I certify that to the best of my knowledge, after appropriate inquires of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

**GOLDER ASSOCIATES INC.**

Gary H. Collison, P.E.
Principal

GHC/GSM/sdp

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At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.


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